

CLAIMS

1. A derivative of azithromycin as base or in the form of an acid addition salt selected from the group of
3'-(*N,N*-didemethyl)-3'-*N*-formylazithromycin of formula 2,
3'-*N*-demethyl-3'-*N*-formylazithromycin of formula 3,
3'-ketoazithromycin of formula 4,
3'-aminoazithromycin of formula 6,
3'-de(dimethylamino)-3',4'-didehydroazithromycin of formula 7, and
(3*R*,6*R*,8*R*,9*R*,10*S*,11*S*,12*R*)-11-[(2,6-dideoxy-3-*C*-methyl-3-*O*-methyl- α -L-*ribo*-hexopyranosyl)oxy]-2-[(1*R*,2*R*)-1,2-dihydroxy-1-methylbutyl]-8-hydroxy-3,4,6,8,10,12-hexamethyl-9-[(3,4,6-trideoxy-3-(dimethylamino)- β -D-*xylo*-hexopyranosyl)oxy]-1-oxa-4-azacyclotridecan-13-one of formula 8.
2. A pharmaceutical composition comprising at least one derivative of azithromycin according to claim 1.
3. A pharmaceutical composition according to claim 2 comprising a mixture of
 - i) at least one derivative of azithromycin according to claim 1, and
 - ii) any azithromycin base or salt in any crystalline, polymorphic or amorphous form, wherein the weight ratio of the at least one derivative described in i) and azithromycin as described in ii) is between 0.1 and 99.
4. A process for preparing 3'-aminoazithromycin of formula 6 comprising oxidation of *N*-demethylazithromycin.
5. A process according to claim 4 wherein the oxidation is carried out with iodine as oxidative agent.
6. A process for preparing 3'-(*N,N*-didemethyl)-3'-*N*-formylazithromycin of formula 2 comprising formylation of 3'-aminoazithromycin of formula 6.
7. A process according to claim 6 wherein the formylation of 3'-aminoazithromycin is carried out by using formic acetic anhydride.

8. A process for preparing 3'-*N*-demethyl-3'-*N*-formylazithromycin of formula 3 comprising formylation of *N*-demethylazithromycin.
9. A process according to claim 8 wherein the formylation is carried out with formic acetic anhydride.
10. A process for preparing 3'-ketoazithromycin of formula 4 comprising oxidation of 3'-aminoazithromycin of formula 6.
11. A process according to claim 10 wherein the oxidation is carried out by using sodium hypochlorite, optionally in the presence of a catalyst.
12. A process for preparing 3'-de(dimethylamino)-3',4'-didehydroazithromycin of formula 7 by oxidizing azithromycin to obtain azithromycin *N*-oxide of formula 5 and decomposing azithromycin *N*-oxide.
13. A process for preparing an azalide of formula 8 by dissolving azithromycin in a polar solvent medium.
14. A process for preparing an azalide of formula 8 from azithromycin containing several cycles of two steps, wherein in a first step azithromycin is anhydified, and in a second step the anhydified product is heated in presence of air.
15. A process according to claim 14 wherein the temperature of the first step and of the second step is higher than 50° C.
16. A process for preparing an azalide of formula 8 wherein the nitrogen atom in position 4 of an azalide of formula 9 is methylated by using a methylating agent and a base.
17. A process for preparing a mixture of an azalide of formula 8 and azithromycin wherein the nitrogen atom in position 4 of an azalide of formula 9 and the nitrogen atom in position 6 of an azalide of formula 11 is methylated by using a methylating agent and a base.